

Remarks

Entry of this amendment, reconsideration of the application and allowance of all claims are respectfully requested. Claims 1-62 remain pending.

By this paper, independent claims 1, 16, 23, 36, 42 & 56 are amended to more clearly point out and distinctly claim certain aspects of the present invention. Although Applicants believe that these aspects were clear initially, the claim amendments presented are submitted in a *bona fide* attempt to further prosecution of the application. By way of example, Applicants' amended claims recite **directly exchanging encode process to encode process** at least one input statistic or encode statistic employed by each encode process of the multiple encode processes. Support for this amended language can be found throughout the application as filed. For example, reference FIGS. 5 & 8B, as well as the supporting discussion thereof. Thus, no new matter is added to the application by any amendment presented.

In the Office Action, claims 1-12, 15-32, 35-52 & 55-62 were rejected under 35 U.S.C. §102(e) as being anticipated by Keesman et al. (U.S. Patent No. 5,805,220; hereinafter Keesman), and claims 13-14, 33-34 & 53-54 were rejected under 35 U.S.C. §103(a) as being unpatentable over Keesman in view of Nam et al. (U.S. Patent No. 5,617,150; hereinafter Nam). These rejections are respectfully, but most strenuously, traversed to any extent deemed applicable to the claims presented herewith, and reconsideration thereof is requested.

Applicants' invention is directed, in one aspect, to a technique for processing multiple streams of video frames (e.g., see independent claims 1, 16, 23, 36, 42 & 56). The technique includes employing multiple encode processes to encode multiple streams of video frames in parallel. Further, there is a direct exchanging encode process to encode process of at least one input statistics or encode statistic employed by each encode process of the multiple encode processes. In addition, the technique includes dynamically adapting encoding of at least one stream of video frames of the multiple streams of video frames based on the relative complexity of the video frames comprising the multiple streams of video frames employing the at least one input statistics or encode statistic directly exchanged between the encode processes. Thus, in Applicants' invention, there is a distributed control strategy integrated within the encode processes themselves which allows the dynamic adjustment of the encoding of one or more streams of video frames responsive to the direct exchanging encode process to encode process.

Various characteristics of the distributed control strategy are recited in numerous dependent claims at issue.

It is well settled that there is no anticipation of a claim unless a single prior art reference discloses: (1) all the same elements of the claimed invention; (2) found in the same situation as the claimed invention; (3) united in the same way as the claimed invention; and (4) in order to perform the identical function as the claimed invention. In this instance, Keesman fails to disclose various aspects of Applicants' invention as recited in the independent claims, and as a result, does not anticipate (or even render obvious) Applicants' invention.

Keesman discloses a system for transmitting a plurality of video programs simultaneously through a transmission channel having a predetermined bitrate. The system includes in cascade a decoding assembly and an encoding assembly. The decoding assembly consists of n parallel decoding means provided in parallel for decoding the coded input signals corresponding to the programs, and the encoding assembly consists of n encoding means in cascade with each of the decoding means and each including a quantizer having a variable step size and a variable length encoder. The system also includes means for controlling the step sizes of the encoding means in dependence upon their respective output bitrates, and these control means are also provided for controlling the output bitrates of the encoding means in dependence upon complexity values associated to the coded input signals of each decoding means with respect to the joint complexity of the plurality of the coded signals. (See Abstract of Keesman.)

Although Keesman does describe a technique for parallel encoding of multiple streams of video frames, the technique employed is clearly distinct from that recited by Applicants in the claims presented. For example, Applicants recite in each independent claim the direct exchanging encode process to encode process of at least one input statistic or encode statistic employed by each encode process of the multiple encode processes. There is no similar facility in Keesman for directly exchanging encoder to encoder of one or more statistics. Rather, Keesman teaches one encode approach such as depicted in FIG. 3 of the present application wherein the external joint rate controller 230 of Applicants' FIG. 3 is equivalent to the joint bit rate adjusting circuit 5 depicted in Fig. 1 of Keesman. However, Applicants' recited invention does not employ an external joint rate controller such as shown in their FIG. 3, and such as taught by Keesman in Fig. 1 thereof. Rather, as clarified in the independent claims presented

herewith, Applicants recite a direct exchanging encoder to encoder (or encode process to encode process) of the one or more input statistic or encode statistic employed by each encoder of the multiple encoders. Further, Applicants recite dynamically adapting encoding of at least one stream of video frames of the multiple streams of video frames based on the relative complexity of the video frames comprising the multiple streams of video frames by employing the at least one input statistic or encode statistic directly exchanged between the encode processes. As recited in various claims presented, Applicants employ a joint rate control strategy that is distributed within the multiple encode processes themselves, and thus, there is a direct exchanging of one or more encode statistics between the encode processes for use in the dynamically adapting. No similar functionality is taught or suggested by Keesman, or the other art of record. For at least this reason, Applicants respectfully request reconsideration and withdrawal of the anticipation rejection to the independent claims presented based upon Keesman. Keesman does not depict or suggest the integration of a facility for exchanging encode process to encode process of one or more input statistic or encode statistic employed by each encode process of the multiple encode processes, let alone a dynamic adjustment being made by one of the encode processes based thereon.

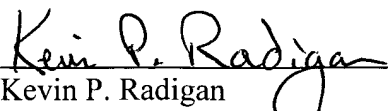
The dependent claims are believed allowable for the same reasons as the independent claims, as well as for their own additional characterizations. For example, dependent claims 2, 17, 24, 37, 43 & 57 each recite an exchange interface within the multiple encode processes, wherein the exchange interface facilitates the directly exchanging encode process to encode process of the at least one input statistic or encode statistic. Various of these claims recite that the direct exchange interface includes dedicated data and control busses directly connecting the multiple encoders for facilitating encoder to encoder exchanging of statistics. A careful review of Keesman fails to uncover any analogous concept. The Office Action cites the adjusting circuit 5, in column 3, lines 23-37 of Keesman. However, as noted above, the adjusting circuit 5 and the discussion thereof at column 3 refers to a control technique that is implemented external to the encoders, as clearly shown by Fig. 1 of Keesman wherein encoding devices 12, 62 are separate from adjusting circuit 5. Further, there is no direct communication between the encoders shown in Keesman, and there is no exchange of input statistics or encode statistics directly between the encoders as recited by Applicants.

As noted, dependent claims 13, 14, 33, 34, 53 & 54 stand rejected as obvious over Keesman in view of Nam. Reconsideration of this rejection is respectfully requested for the reasons noted above with respect to the independent claims. The Office Action notes that Keesman does not teach the modifying being accomplished at a group of picture boundary or scene change in the stream of video frames being encoded by the at least one encode process, and therefore, cites the teachings of Nam. Without acquiescing to the characterizations of Nam stated in the Office Action, Applicants note that a careful reading of Nam fails to uncover any teaching or suggestion of the above-noted deficiencies of Keesman when applied against the independent claims presented. Specifically, Nam describes a video bit rate control method for an encode process, however, does not teach or suggest the direct exchange encode process to encode process of one or more statistics employed by each encode process. Thus, Applicants respectfully request reconsideration and withdrawal of the obviousness rejection to these dependent claims.

For all of the above reasons, the claims submitted herewith are believed to be in condition for allowance, and such action is respectfully requested.

If a telephone conference would be of assistance in advancing prosecution of the subject application, Applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,


Kevin P. Radigan
Attorney for Applicants
Registration No.: 31,789

Dated: April 25, 2005.

HESLIN ROTHENBERG FARLEY & MESITI P.C.
5 Columbia Circle
Albany, New York 12203-5160
Telephone: (518) 452-5600
Facsimile: (518) 452-5579